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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/476,633 12/31/99 WANG

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MMC2/0206  
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EXAMINER

GARCIA, J

ART UNIT

PAPER NUMBER

2823

DATE MAILED:

02/06/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/476,633

Applicant(s)

Wang et al

Examiner

Joannie Ad II García

Group Art Unit

2823



☒ Responsive to communication(s) filed on 10/10/00

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claim

☒ Claim(s) 1-4 and 6-22 is/are pending in the application

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-4 and 6-22 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s) \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-4, 6, 7, 9-15, and 18-20, are rejected under 35 U.S.C. 103(a) as being unpatentable over Grumbine et al, and further in view of the following comment.

Grumbine et al teaches a removing a particle from a metal surface of a via by introducing a first agent to a metal layer, polishing the metal layer with first agent, and introducing a second agent comprising hydrogen peroxide. He also discloses that polishing the metal layer comprises polishing a metal material selected from the group consisting of tungsten, copper and aluminum. He also teaches that polishing the metal layer comprises polishing with the first agent having an abrasive material selected from the group consisting of silica, alumina, zirconia, and ceria. He discloses as well, that polishing comprises chemical mechanical polishing. He is also teaching that introducing the second agent comprises introducing a second agent of approximately 4% by volume or less of hydrogen peroxide. He also teaches polishing the substrate with the second agent. He also discloses depositing a slurry onto the substrate, polishing the metal layer and the substrate, and rinsing a metal plug with a solution comprising hydrogen peroxide. He is teaching as well, that polishing the metal layer includes removing the metal. (Column 2, lines 23-32, Column 3, lines 32-38, lines 47-56, and 61-67, Column 4, lines 48-53, Column 6, lines 43-46, and Column 10, lines 40-51). Grumbine et al does not disclose sequential use of slurries with and without hydrogen peroxide. However, in view of the disclosure that both types of slurries are

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effective in polishing metals. It would have been within the scope of one of ordinary skill in the art to employ a slurry containing hydrogen peroxide subsequent to another slurry to achieve respective portions of the polishing step. (See Example 2).

Claims 8, 16, 17, 21, and 22, are rejected under 35 U.S.C. 103(a) as being unpatentable over Grumbine et al as applied to claim 1-4, 6, 7, 9-11, 13-15, 18, and 20 above, and further in view of Robinson et al (U.S. Patent 5,990,012), and the following comment.

Grumbine et al does not disclose that rinsing occurs during polishing, that polishing the metal layer with the second agent includes polishing with a polisher operating at a polishing pressure approximately in the range of 0.5 psi to 2.0 psi, and that the metal layer is removed at a rate of 60 Å/minute. Robinson et al discloses rinsing during a polishing operation (Column 1, lines 48-50). It would have been within the scope of one of ordinary skill in the art to employ the process of Robinson et al for its disclosed intended purpose to achieve the metal layer polishing step of Grumbine et al. It would be a matter of routine optimization within the teachings of Grumbine to determine a suitable pressure and a suitable rate to achieve the metal layer polishing step and metal layer removal step.

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**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

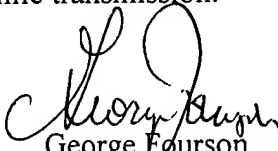
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956. See **MPEP 203.08**.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner J. Garcia whose telephone number is (703) 306-5733. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax number for this group is (703) 308-7722 (and 7724), and (703) 305-3431 (and 3432). MPEP 502.01 contains instructions regarding procedures used in submitting responses by facsimile transmission.

  
George Fourson  
Primary Examiner  
Art Unit 2823

  
JAG

January 31, 2001